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The

Causes and Treatment of Rheumatoid Arthritis.

Samuel Hyde, M.D.

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ROBERT W. LOVETT MEMORIAL

Walter Bauer

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OF

RHEUMATOID ARTHRITIS

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With the author's
Kind regards.

THE CAUSES

AND

TREATMENT

OF

RHEUMATOID ARTHRITIS

BY

SAMUEL HYDE, M.D.

Vice-President and Chairman of Council, British Balneological and Climatological Society;
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1896

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ROBERT W. LOVETT MEMORIAL

TO

SIR EDWARD H. SIEVEKING,

M.D., F.R.C.P., K.B., LL.D.,

PHYSICIAN IN ORDINARY TO H.M. THE QUEEN;
PHYSICIAN IN ORDINARY TO H.R.H. THE PRINCE OF WALES;
KNIGHT OF THE ORDER OF ST. JOHN OF JERUSALEM;
CONSULTING PHYSICIAN TO ST. MARY'S HOSPITAL;
FELLOW, AND LATE PRESIDENT, OF
THE ROYAL MEDICAL AND CHIRURGICAL SOCIETY,

THIS WORK IS DEDICATED

IN GRATITUDE FOR

MANY KINDNESSES

AND MUCH TRUE-HEARTED FRIENDSHIP

BY THE AUTHOR.

Walter Dawson

PREFACE.

THE disease designated rheumatoid arthritis, from the time of Landré Beauvais to the present, has provided a theme for many writers, and several really useful works upon the subject are in existence. Amongst these the recent admirable treatise of Dr. Archibald Garrod is deserving of particular mention.

It appeared to the writer, however, that whilst the authors referred to have contributed largely to the store of useful information upon the causes, symptoms, diagnosis, and pathology of rheumatoid arthritis, the question of treatment has received but scant attention. Indeed, according to the views of many writers upon this subject, very little good is to be derived from any treatment of this disease when once it is established. With opinions like this prevailing widely in the profession it is not surprising that so little attention has been devoted to treatment. The exceptional opportunities which many

years' practice in Buxton has afforded me of studying this disease and watching the results of its treatment must be my excuse for writing the present work, more especially with a view to the encouragement of treatment. I venture to hope that it may prove useful to some of my medical brethren, and help in some measure to counteract that "gospel of despair," which has too often hindered the restoration of many sufferers from this distressing malady. Having expressed this hope I would only crave the kind indulgence of my readers for many imperfections of which I am deeply conscious.

SAMUEL HYDE.

3, HARDWICK STREET,
BUXTON.
July 1, 1896.

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THE CAUSES AND TREATMENT OF RHEUMATOID ARTHRITIS.

CHAPTER I.

Introductory.

If it be true that the treatment of those painful and troublesome affections which are generally described as rheumatoid arthritis was formerly held to be of no real service, it may now be stated that since the pathology of the disease has become better understood, and its causes more clearly recognised, the treatment of rheumatoid arthritis does not necessarily produce barren results, but yields, not infrequently, some of the most striking triumphs in modern therapeutics.

Much of the non-success attending the treatment of this disease, hitherto, has been undoubtedly due to the confused notions which have prevailed so widely as to its pathology. Notwithstanding that it is now nearly a hundred years since Landré Beauvais indicated

the peculiar characteristics of this disease, as distinct from certain gouty affections of similar characters (to these cases he gave the name of *goutte asthénique primitive*), it is remarkable that only in comparatively recent years any real progress has been made in the pathological and clinical investigation of rheumatoid arthritis. Two of the earliest followers of Landré Beauvais in this work were Heberden and Haygarth, who both wrote upon the subject of rheumatoid arthritis very early in the present century; but it appears to have received little or no attention subsequently until after 1836, when Cruveilhier, Lobstein, Broca, Deville, Vidal, Charcot and Trastour on the Continent, and Canton, Adams, R. Smith, Scudamore and Aston Key in this country, each contributed to the further elucidation of the disease. In more recent years the names of Dr. Fuller, Dr. Senator, Sir Alfred Garrod, Sir Dyce Duckworth, Mr. Jonathan Hutchinson, Dr. W. M. Ord, Dr. Archibald Garrod, Dr. J. Kent Spender, Dr. Fortescue Fox, and Mr. Hugh Lane have been associated with the most modern advances in the study of rheumatoid arthritis.

In these pages I have decided to adhere to the name for this disease which was first suggested by my distinguished former teacher, Sir Alfred Garrod. Rheumatoid arthritis may not be a designation altogether free from objection, but, if wide and almost general acceptance be

a criterion, it would appear to be the best of the very many names which have been invented to designate the disease now under consideration.

As it will be my chief object in the following pages to describe and discuss the most modern methods of the treatment of rheumatoid arthritis, and the causes of the disease in relation to treatment, I shall pass over briefly the etiology, predisposing and exciting causes, symptoms and diagnosis, morbid anatomy and pathology of this affection, all of which present most interesting topics for discussion, but which, to treat thoroughly, would greatly outstrip the limited compass of the present manual.

It is necessary at the outset to remind the reader that rheumatoid arthritis possesses characteristics which are clearly and markedly distinct from those of either chronic articular rheumatism, or chronic articular gout, in each of which the joint affection is but a part of a general constitutional disease. In rheumatoid arthritis we have an interesting series of articular lesions, which are *independent* of those visceral lesions which are such frequent concomitants of rheumatism, and of those uratic conditions commonly associated with gout. Rheumatoid arthritis may, and does sometimes, follow some previous attacks of gout or rheumatism, but such cases do not alter the fact that rheumatoid arthritis can, *and in most*

instances does, arise as an independent and primary disease.

It is difficult in the present state of our knowledge of this disease to give a satisfactory definition of rheumatoid arthritis. Dr. Archibald Garrod defines it as "a dystrophy of the joints which is not dependent upon any recognisable central lesion." As, however, nearly all modern observers, including Dr. Garrod himself, agree in attributing this disease to some cause situated in the central nervous system, I think this definition is somewhat unfortunate. If I might venture to add a new definition to those already enunciated by previous writers, I should rather say that rheumatoid arthritis is a trophoneurosis of joints unassociated with any systemic disorder, and probably dependent upon some central nervous lesion.

I am quite aware that in adopting such a definition I run counter to the views of certain well-known writers upon this subject. Whilst it is a fact that many modern observers are of opinion that some nervous lesion is the foundation of those profound and painful degenerative changes, both arthritic and atrophic, which characterise this disease, there is a division of opinion amongst such writers as to whether the causative nervous lesion is peripheral or of central origin. As for my own opinion, I am strongly inclined to believe that a central nervous lesion constitutes the starting point

in the majority of pronounced and characteristic cases of rheumatoid arthritis—an opinion based in great measure upon personal clinical observation and inquiry into a very large number of cases. I shall, however, have occasion to refer to this subject in a later chapter.

Charcot divided the various forms of rheumatoid arthritis into three groups, thus :—

(1) Cases in which the disease assumes a primary, general and progressive type, attacking numerous joints, particularly the fingers, in symmetrical fashion, and other joints successively and in similar fashion.

(2) Localised or monarticular forms of the disease, generally confined to one or two of the larger joints.

(3) Heberden's nodes. Enlargements of the terminal finger joints, leaving free the metacarpo-phalangeal articulations, and often erroneously included amongst gouty articulations.

To these Dr. Archibald Garrod very properly suggests a fourth group, viz., those cases in which the rheumatoid changes affect joints which have been the seats of other forms of disease, and which may be either monarticular or polyarticular according to the number of the primary lesions. He also enumerates another localised variety, which, he says, usually follows a local injury, slight or severe, and differing widely from the polyarticular form in attacking the larger instead of the

smaller joints, and attacking men more frequently than women. I cannot, however, see why these cases should be classed as a separate variety, as they appropriately and conveniently fall within the "group of cases in which the rheumatoid changes affect joints which have been the seats of other forms of disease" last referred to.

CHAPTER II.

Etiology: Predisposing and Exciting Causes.

Perhaps the most striking etiological fact in connection with rheumatoid arthritis, particularly of the polyarticular variety, is the influence of sex in the production of the disease. Dr. Archibald Garrod found that in 500 cases, no less than 411 were females and only eighty-nine males. Of 447 cases admitted into the Devonshire Hospital, Buxton, during the year 1895, there were 349 females and ninety-eight males. Although the latter figures show an enormous excess of females over males, it is probably below the real proportion, and Dr. Garrod's figures may be taken as nearer the mark. Undoubtedly, when the monarticular or localised cases are excluded, the disease is rarely seen in the male sex.

Hereditary tendency does not appear to exercise very much influence in the development of rheumatoid arthritis. The writer has met with a few cases in which there was a distinct family history of this disease, generally on the mother's side, but such histories occur with nothing like the frequency and regularity that they do in gout and rheumatism.

And in those cases noted by the writer, there was always associated with the history, one of general debility or serious nervous disturbance. Whilst it would thus appear that in rheumatoid arthritis a previous family history of the same disease is rarely met with, it is very commonly seen in gouty families. Rheumatoid arthritis may occur at any age, but it is most frequent between 35 and 50 years of age. The excessive preponderance of this disease amongst females, and its most frequent period of occurrence being at or near the age of the menopause in women, has naturally led observers to look for some connection between rheumatoid arthritis and uterine and ovarian diseases. Dr. Fuller and Dr. Ord have drawn particular attention to this subject, and have laid much stress upon the causative relation of such diseases to rheumatoid arthritis. It is very much to be doubted, however, whether these gentlemen ever intended their views to give countenance to the extravagant deductions which have been made by certain writers. Uterine and ovarian derangements are doubtless often associated with rheumatoid arthritis, but I question either the necessity or desirability of that frequent interference which seems to be in so much favour with some.

Among the causes which often operate directly in the development of rheumatoid arthritis, damp and cold occupy a prominent place. It will, however, be generally noticed when

such factors are adduced as causes of the attack, that there was some predisposing condition of lowered general health, the presence of which was probably an essential element in bringing about the result. Cold and damp are fruitful causes of rheumatoid arthritis only in the sense in which other causes act as depressants to local and general vitality. It is probable that chill has more to do with aggravating the symptoms after the disease has already been developed, than it has in exercising a causative influence prior thereto.

In the writer's experience no causes are more productive of this distressing malady than certain psychical conditions associated with anxiety and mental distress. Mental grief following bereavement, anxiety and long watching over sick relatives, business worries and anxieties—these and similar causes are only too frequently immediate antecedents of this disease. Nor can it be doubted that it may follow a sudden mental shock. Cases are on record where rheumatoid arthritis has succeeded to shocks of the nervous system produced by the explosion of shells during the bombardment of invested cities. Other cases occur in which the disease appears to have resulted partly from sudden shock and partly from protracted grief. The following case which came under my care recently is an example:—

Mrs. C., aged 48, about nine years ago lost a

son by drowning, and shortly afterwards developed arthritic troubles of both hands and fingers. In addition to the shock referred to she passed through a long period of inconsolable grief, during which time other joints became affected, and her condition grew worse. Some three years later her symptoms were greatly aggravated after a period of anxious nursing of a paralysed mother. Since then she has gradually become worse, and now the fingers, hands, elbows, shoulders, knees and ankles are affected. Left elbow is ankylosed, and both shoulders nearly so. The patient is greatly emaciated and almost a complete cripple.

We have here a case in which the sudden mental shock produced by the violent death of the patient's child was almost immediately followed by polyarticular lesions. These lesions extended to other joints, and the patient's condition waxed worse as the nervous strain of intense grief was prolonged, and then to the articular troubles were added, in due course, the usual atrophic and other degenerative changes characteristic of this disease.

With regard to direct injury to a joint as the cause of rheumatoid arthritis I have little to say. In my experience the cases are very rare in which polyarticular rheumatoid arthritis has followed an injury to a single joint, and in those I have met the injury has appeared more as an accidental coincidence to

a more general cause. Even in those cases of arthritis deformans affecting only one joint, and where there has been a history of injury to the joint, I have generally found some independent lesion frequently of a neural form.

A case in point was a lady sent to me last year by Mr. Tubby, of Portland Place, suffering from "traumatic osteo-arthritis." About a year previously the patient had violently sprained the right knee when descending stairs. The joint became much swelled and painful. The swelling in great measure eventually subsided, but was followed by stiffness and inability to move the joint without extreme pain. When I saw her she was only able to walk on crutches. At that time there was not much swelling of the joint, but great stiffness and some grating of the joint when moved slightly, which gave intense suffering. The patient was highly neurotic, and had passed through several illnesses, including a severe attack of influenza about three months after the accident. Judging from a careful study of this case, and the subsequent treatment which was successful in restoring the joint to usefulness, I cannot view it as a traumatic lesion so much as a trophoneurosis of the joint due to a general neurotic temperament, which was determined to this special joint by the injury referred to.

It may be remarked here that whilst rheumatoid arthritis is a disease distinct from

rheumatism or gout, it may, and not uncommonly does, develop as a sequela of an acute attack of rheumatism and possibly of gout. I do not think, however, that in such cases there is any continued influence of the rheumatic or gouty process, or that there is any mixture of a primary and secondary disease. In these cases the rheumatoid arthritis is a secondary affection of a dystrophic or trophoneurotic character, and may occur in joints which have suffered from any arthritis, whether the result of acute rheumatism, gonorrhœal rheumatism, acute gout, or a traumatic injury. I have here included acute gout, because it is customary to do so, but I must confess to some doubt upon the subject of rheumatoid arthritis following attacks of acute gout. I have often seen cases which were alleged to have followed acute gout, but I never personally observed acute articular gout followed by rheumatoid arthritis. On the contrary, I strongly suspect that in most of these cases the primary articular lesion was of a rheumatic and not gouty character.

CHAPTER III.

Symptoms and Diagnosis.

The early symptoms of rheumatoid arthritis are, generally speaking, somewhat obscure and insidious in development. Premonitory symptoms in the form of sensory disturbances, such as tingling, numbness, hyperæsthesia, cutaneous pain of a burning character, are sometimes experienced in the upper and lower limbs. Patients have often stated to me that the first symptom that attracted their notice was an aching pain over some part of the spine, or a sensation of cold water or air passing down the back. Others suffer from periodical digestive disturbances, attended by light-coloured fæces, such as are met with in ordinary jaundice.

Dr. Kent Spender has made much account of a "disseminated form of pigmentation, commonly called freckles," and also of a neuralgic pain in the ball of the thumb, or on the inner side of the wrist. Such symptoms are, it is true, often met with in early cases of this disease, but I cannot agree with Dr. Spender's

opinion that they are practically pathognomonic of the disease.

As regards the articular symptoms, more or less swelling and stiffness about the joints which are affected first attract attention. These may be accompanied by pain, but this is rarely very severe if the parts are at rest, and may be absent altogether except when the joints are moved. The swellings are due to several conditions, viz., enlargement of the articular ends of the bones, increased secretion in synovial capsules or adjacent bursæ, and swelling of cartilages, ligaments, tendons, and the fibrous attachments of muscles. Sometimes these enlargements are chiefly confined to the immediate neighbourhood of the joints; in other cases the swelling may affect the entire finger, hand, or foot, the joints of which happen to be involved. With the swelling there is generally some œdema of the parts, but this is not so marked as in ordinary œdema. It also varies in amount from time to time, increasing with warmth of the parts and diminishing when they are cold. This swelling or puffiness varies at different periods even in the course of one day. Thus the enlargement, œdema, and pain may be worse at nights and after meals, and patients frequently complain of feeling worse on rising in the morning, gradually improving as the day advances. These alternate periods of effusion and partial absorption are very marked in some cases, particularly in the

polyarticular variety of the disease and in the earlier stages thereof. It is these exacerbations and remissions, giving an acute or sub-acute character to the malady, which so frequently lead to mistakes in diagnosis and its confusion with rheumatism or gout, from which it ought to be clearly and distinctly dissociated. As the disease progresses the swellings alter in character, becoming less puffy and more firm on pressure. There is a general condensation of the various affected tissues, due to a gradual organisation of the effused matters into a low form of fibrous tissue and even into irregular bony masses or protuberances. Then we get the numerous deformities peculiar to advanced cases of rheumatoid arthritis. Some of these deformities are very characteristic of the disease in the polyarticular variety, and form valuable diagnostic signs. For example, the small phalangeal joints of the fingers are, generally speaking, the first attacked; the disease is symmetrical, corresponding joints being affected on either side; it has a tendency to advance up the limbs towards the joints nearer the trunk, as was first pointed out by Charcot; there is also a tendency to deflection of the terminal phalanges of the fingers towards the radial side of the hand when the terminal joints are affected, and of deflection towards the ulnar side when the metacarpo-phalangeal joints are affected; the hands and fingers frequently present charac-

teristic fixed flexions and extensions of the various joints. These and other deformities cripple the patient to such an extent sometimes that all useful movements are lost, and a state of abject helplessness may result.

Nor must I omit to mention here the peculiar liability of the temporo-maxillary articulation to become affected in this disease. Pain, stiffness, and grating about this joint, when present, may be taken as pathognomonic of rheumatoid arthritis.

The symptoms of the monarticular variety of rheumatoid arthritis run a similar course, except that the local signs are confined as a rule to one joint, and that one of the larger joints nearer the trunk of the body, such as the hip, shoulder, knee or elbow. It is said that this variety occurs more frequently in men than women, but in my experience it has occurred in about equal proportions in both sexes. It very frequently follows in joints which have been previously damaged by rheumatism, or have been subject to local traumatic injury.

Probably the most common symptom, apart from the joint troubles in this disease, is the more or less profound atrophy of muscles which are concerned in the movements of the affected joints. Nor is this atrophy merely the result of disease of the joint, but, as we shall see later on, when discussing the pathology of rheumatoid arthritis, it is probably

Walter Baum

due to a central nervous lesion in common with the articular disease. This atrophy affects the extensor muscles chiefly, but not solely, and the reflexes of all the limbs may be increased, but particularly of those which have joints affected by this disease. Sharp, crampy pains, which last sometimes for several hours, are not infrequently associated with this atrophy of the muscles. The general symptoms manifested during the progress of the disease are those of general debility, dyspepsia, loss of appetite, general weakness and loss of flesh. A frequent and striking symptom is the presence of moist and even wet hands, due to excessive secretion of the sweat glands.

We now come to the subject of diagnosis. This is most important, as the success or non-success in the treatment of rheumatoid arthritis depends in large measure upon its correct differentiation from other diseases with which it may be confounded. The diseases which are most likely to be mistaken for rheumatoid arthritis are gout and rheumatism. The chief points in which it differs from gout are these. In gout the blood contains uric acid and bi-urate of sodium is deposited in and about the affected joints. In rheumatoid arthritis the blood is free from uric acid, and no deposits of bi-urate of soda are found in or about the affected joints. Gout is very liable to affect the viscera, but in rheumatoid arthritis there is no such tendency. In rheumatoid arthritis the

finger joints are more commonly attacked first; the temporo-maxillary and cervical articulations are frequently affected, and there is commonly a symmetrical character about the joint troubles. In gout, on the other hand, the toes are more often first attacked; the joints of the jaws and neck are rarely, if ever, affected, and there is no symmetry about the course of the disease. In rheumatoid arthritis females are more often afflicted than males, and heredity would appear to have no influence, whilst in gout, males are more frequent sufferers and heredity strongly predisposes to the disease.

The main points in which rheumatism differs from rheumatoid arthritis are the liability of rheumatism to implicate the heart and other visceral organs, and to most frequently affect the young, whilst in rheumatoid arthritis the viscera are unaffected, and it is peculiarly a disease most commonly associated with the degenerative period of life. Rheumatism tends to run an acute or sub-acute course whilst rheumatoid arthritis is generally a chronic and slowly progressive disease. Rheumatism has no symmetrical character, and is very erratic in its attacks upon the joints; the extreme atrophic changes in the muscles so characteristic of rheumatoid arthritis are absent in ordinary cases of rheumatism.

Amongst other diseases from which rheumatoid arthritis must be diagnosed the following

should be noted—locomotor ataxia, traumatic injuries of joints, gonorrhœal rheumatism and pyæmic affections of joints. The previous history of the case and careful attention to those peculiar characteristics of rheumatoid arthritis already mentioned will enable the practitioner to arrive at a correct diagnosis as a rule, without any great difficulty.

CHAPTER IV.

Morbid Anatomy of Rheumatoid Arthritis.

It has been remarked by more than one writer upon this subject that the opportunities of examining the *post-mortem* appearances of the joints in the early stages of rheumatoid arthritis are rare, in consequence of its non-fatal character. Hence it is that our knowledge of the morbid anatomy of this disease is necessarily limited. The morbid changes met with are confined, as far as we know, chiefly to the affected joints and adjacent structures as well as the muscles concerned in the movements of these joints.

It has long been debated whether the changes occurring in the joints are of an inflammatory nature or due to mere nutritional disturbance, and the question is still undecided. The slow and gradual swelling of the joints unaccompanied by local or general pyrexia, and by little appreciable tenderness and other signs of inflammation, which characterise such a large proportion of cases, would point to a purely degenerative change in the joint-struc-

tures. On the other hand some cases do in their early stages present signs of acute or sub-acute inflammation of the joints which it would be difficult to explain by a non-inflammatory process. The view is now pretty widely held that "the changes in the joints are partly inflammatory, partly degenerative." My own opinion differs somewhat from this, in that I believe the changes which occur in the structures of the joint are on the whole due to abnormal nutrition, and that the process may be in some cases associated with an inflammatory process, but not necessarily so. I cannot, however, agree with those who hold that the inflammatory changes, when they do occur, are secondary processes. The changes referred to take place in the ends of the bones, in the articular cartilages and in the synovial membrane. Which structures are the first to be attacked is uncertain, but there is no doubt the cartilages are affected early in the diseased process. The articular cartilage assumes at first a velvety appearance due to the breaking up and fibrillation of the superficial layers of cells. The central portions become worn or eroded, until, in some cases, the bone is laid bare, and at the same time the edges of the cartilage become thickened or heaped up, or lipped around the margin. These marginal lips ultimately become ossified and form osteophytes. At the same time the epiphyses of the bones undergo remarkable changes. The surfaces

are bared of their articular cartilage and become smooth and dense like ivory—hence the term eburnation applied to this condition. Osteophytic out-growths occur which destroy the shape of the joint and ultimately lead to bony ankylosis. The synovial membrane is more or less congested and greatly thickened, its fringes are also much thickened and sometimes contain cartilaginous substances which are apt to become detached and give rise to loose bodies in the joint-cavity. This cavity frequently contains effused fluid, although it is as often practically free from fluid. Along with these degenerative processes the ligaments are thinned and may disappear altogether, giving rise to additional deformity and cripplement of the joint.

The muscles connected with an affected joint suffer severe atrophy and distinct neuritis of the peripheral nerves is frequently met with in rheumatoid arthritis. It is to be hoped that the *post-mortem* appearances of the spinal cord in cases of rheumatoid arthritis will receive more careful attention in the future, for, although no primary lesion of the cord has been discovered hitherto, it is more than possible that such will ultimately be found.

CHAPTER V.

Pathology of Rheumatoid Arthritis.

After what has already been said in the preceding chapters, it will scarcely be necessary to discuss all the various theories which have been advanced as to the pathology of rheumatoid arthritis. Before considering at some length the theories which I think afford the most satisfactory pathological explanation, reference must be made to those which have found favour with certain observers.

First must be mentioned the theory which views rheumatoid arthritis as a combination of gout and rheumatism. This opinion has been very popular in the past, and has been advocated by Mr. Jonathan Hutchinson.

Next we have the theory that this disease is only a chronic result of ordinary acute rheumatism, being in fact but a continuation of the primary morbid process.

Then we have the distinctly opposite theories of Dr. Fuller and Mr. Arbuthnot Lane, the first looking upon rheumatoid arthritis as a distinct systemic disease, and the latter not

viewing it as a disease of itself, but considering the joint affections as only the results of local pressure and wear of the articular surfaces.

Lastly, we have the theory of a nervous influence producing disturbed nutrition of the joints and neighbouring muscles. Remak was the first to advocate this view, and the more it has been studied the more light has been cast upon the difficulties which present themselves in considering the pathology of rheumatoid arthritis.

As I have just before hinted, it will be evident from what has been said upon the etiology, causes, symptoms, morbid anatomy, and diagnosis of this disease, that neither the rheumatic nor the gouty view can be accepted. Equally inadmissible is Mr. Lane's theory, which is negatived by the fact that the articular lesions occur in subjects where there has been no particular wear and tear of the joints, and by the extremely symmetrical character of the lesions in so many cases of this disease.

Much attention has been given during recent years to inquiries into the primary causes of the profound and painful degenerative changes which form the local characteristics of rheumatoid arthritis—changes which, as we have seen, are roughly divided into arthritic enlargements and deformities and muscular atrophy and paralysis.

Whilst it must be admitted that in a large

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number of cases presenting well-marked characteristics of this disease which come under notice, the etiology does not point very clearly to a neural cause, experience and observation would seem to indicate that a nervous lesion is the foundation of the arthritic and atrophic changes in the majority of the more grave and pronounced examples of rheumatoid arthritis.

The point which appears still most in doubt is as to whether this neural element in the causation of the disease is of a central, or peripheral character? Dr. Kent Spender, of Bath, in a thoughtful and able paper on "The Atrophic Phenomena of Rheumatoid Arthritis," read before the Bath and Bristol Branch of the British Medical Association, on Nov. 29, 1893, contends that the phenomena of muscular atrophy so generally associated with this disease are myelopathic, and capable of strict definition as a spinal paralysis. Speaking of the concurrent arthritis, he states that this, together with the muscular atrophy, are sequences of a common antecedent cause. Some writers regard the muscular atrophy met with in the neighbourhood of the affected joints as of reflex origin, the joint irritation being transmitted along sensory nerve fibres to the cord and there inhibiting in some way the functions of the motor cells in the anterior horns. Dr. Judson Bury, while admitting this view as the more probable for many cases,

points out the frequency of a co-existing peripheral neuritis, but for a full discussion of the subject I must refer the reader to Dr. Bury's "Treatise on Peripheral Neuritis," pp. 335-354. Finally, some hold that the local muscular waste and loss of power is a simple myopathy or lesion of the muscles themselves.

Having had opportunities of observing a very large number of cases of rheumatoid arthritis during many years of special practice amongst this class of diseases, I am inclined to favour a purely nervous lesion as the primary cause of this terrible malady, and I am confirmed in this opinion by the results of my treatment of such cases. The more this factor in the causation of the disease has been recognised and allowed to influence my treatment, the more I have been encouraged by the results.

I will give one or two cases which will illustrate this proposition, and at the same time show the difficulty of referring all cases to a central spinal lesion, or, on the other hand, to a peripheral neural lesion.

As a matter of fact, some cases point strongly to a myelopathy, or lesion of the spinal cord, some to a neuropathy, or lesion of the nerves, and in other cases the atrophy and paralysis at least seem dependent entirely upon a myopathy or lesion of the muscles of the affected parts.

The following case was one in which the

myelopathic origin of the disease was so marked as to exclude almost any possibility of doubt.

A married lady, aged 35, came under my care suffering from rheumatoid arthritis with all the symptoms of atrophic muscular paralysis, enlarged, fixed and painful joints, and general emaciation of the most advanced character. The disease had commenced some four years before with persistent pains in the back, and pain and swelling of joints. These symptoms followed a prolonged and exhaustive season of nursing a sick child. Matters had gradually gone worse, with the exception of several short intervals of slight improvement. For nearly a year before I saw her she had lain on her back a helpless cripple totally unable to move. The skin was thin and wasted and all muscular and fatty tissue had nearly disappeared. The pulse was exceedingly quick and weak, and the respiration short and hurried. The knee-joints were contracted and, together with all the other joints of the limbs, were enlarged, painful and fixed. The cervical joints and muscles were painful and rigid, as also the temporo-maxillary joints and muscles. Mastication, deglutition and articulation were alike difficult and painful. As it was impossible to move or even raise the patient without intense suffering, the case was practically hopeless from the first, and she died about a month later.

This case occurred many years ago when

the question of the spinal origin of rheumatoid arthritis had received but little notice at the hands of observers. It, however, made a great impression upon my mind at the time and led me to pay increased attention to the subject. The symptoms were so profoundly marked that it was impossible to attribute them to peripheral lesions of the joints or muscles, nor yet to any merely reflex nervous influence, and I was constrained to admit a purely central lesion of a spinal character as the cause of the degenerative changes in the joints, muscles and other parts. I have since seen many cases presenting similar symptoms in which there seemed little doubt as to the myelopathic character of the disease. In some of these cases I have been able to ascertain the history of some previous spinal injury generally of the nature of concussion. In many instances, however, I have not been able to hear of anything in the nature of an actual injury.

I have recently had under treatment a gentleman suffering from rheumatoid affection which gradually developed subsequently to an accident some ten years ago, when he suffered concussion of the spine by being knocked over the side of a quay into a barge by a moving crane.

I cannot leave the subject of pathology without offering some remarks upon a question which has occupied my attention for some

time past, viz., How far may diseased processes of joints—such as rheumatoid arthritis—be influenced by disturbance of the internal secretions of certain glands or tissues?

The thyroid treatment of myxœdema has led to extensive inquiries into the general question of the physiological importance of certain other glands or organs, the real functions of which have been little understood in the past.

Recent physiological research has established the fact that, the so-called ductless glands possess special powers of secretion, and that their special secretions pass into the blood independently of ducts. Also that glands with ducts, such as the liver and the pancreas, secrete other secretions apart from those which pass out through their ducts, which secretions are taken up by the blood as in the case of ductless glands. To this class of secretions has been given the designation "internal secretions," to distinguish them from the secretions poured out through ducts which are now termed "external secretions." Nor is this all. It appears to have been proved beyond doubt that powers of secretion are not confined to glandular organs, but that *all organs and tissues possess and exercise this power of internal secretion.*

It has been stated by Professor E. A. Schäfer that some glands—such as the liver and the pancreas—are more essential to life

by reason of the internal secretions which they furnish to the blood than by their external secretions of bile and pancreatic juice. That the internal secretions of such glands as the thyroid, supra-renals, thymus, and pituitary body play a no less important *rôle* in the physiology of life is abundantly proved, not only by experiments upon animals, but by clinical observation.

Another important fact revealed by recent investigation is this: that some of these glands seem to act in concert *with one another* and even *for one another* or vicariously. Hoffmeister performed thyroidectomy in rabbits and found that this was afterwards followed by structural changes in other glands, including the ovaries, kidneys, pituitary body, and also in the bony skeleton. It has also been observed that enlargement of the lymphatic glands follows the removal of the spleen. It would thus seem necessary to healthy and normal nutrition of all parts of the animal organism that the various internal secretions should circulate in definite proportions and combinations, maintaining in fact a sort of physiological equilibrium throughout the entire system. It would further appear that when this equilibrium is disturbed either by an excess or by a diminution of one or other of the internal secretions, diseased conditions such as myxœdema, osteomalacia and acromegaly are developed. From this the question

naturally arises whether many morbid processes, hitherto commonly attributed to other or more external causes, are not more probably caused by some disturbance of these hæmopoietic glands.

Again, observation proves that nutritional changes of a grave and pronounced character are often manifested in or about the joints and bones of the extremities in some forms of disease which are undoubtedly due to perverted supply of the internal secretions of certain glands. If this be so, may not some of those morbid conditions of joints generally looked upon as rheumatoid or gouty, originate from such a cause? There is at present no absolute proof of this, but the question is worthy of further investigation.

Some German pathologists have referred such morbid conditions as lithæmia to "auto-toxication," the result of the accumulation of certain leucomaines or azotised products of regressive metamorphosis of the albuminoid substances in the tissues. These products they classify as "intermediary" because their oxidation during the regressive process stops short of urea. The accumulation of these "intermediary" products in the tissues evolves, so it is said, constitutional and local diseases of the most complex character according to the locality and quality of each particular tissue implicated. It is, I think, conceivable under this hypothesis that internal secretions

may exercise an important influence upon this intra-organic oxidation within the tissues, either by retarding or accelerating the process. Nay, is it not possible that in the physiological facts referred to lie the germs of principles which may yet revolutionise much of our present pathology and treatment? As regards the particular question now under review, since every tissue and every organ of the body furnishes an internal secretion peculiar to itself which exercises an important influence upon the process of metabolism, it seems highly desirable that in studying the diseases of joints, we should bear in mind that the synovial fluid of joints and bursæ is not the only secretion with which we are concerned. It does appear to me remarkable that in the somewhat confused and conflicting pathology of rheumatoid arthritis and other joint affections this fact has not hitherto received that consideration which its importance deserves.

We have seen that the internal secretions of such glands as the pituitary body exercise an undoubted influence upon the nutrition of bones and joints. This is strikingly illustrated in acromegaly, in many cases of which, hypertrophy, or other disease of the hypophysis cerebri has been discovered.

When we have disease due to such glandular causes, probably it is some alteration in the quality or quantity of the internal secretion which plays the essential part in the process.

Is this abnormality then one of absence or diminution of secretion? or is it one of excessive secretion? Does it consist of some perverted function by which the internal secretion is rendered toxic, either by the addition of some foreign principle or the absence of an essential counteracting principle? Or is there a disturbance of the physiological equilibrium, and inter-action between one internal secretion and other internal secretions, which there is good reason to believe exists in the circulatory system? These are questions to which no sufficiently satisfactory answer has yet been given.

Personally, I am inclined to the view that rheumatoid arthritis, and many chronic joint affections are due to perverted internal secretions, partly of a toxic character and partly dependent upon disturbed equilibrium, or interaction between two or more internal secretions of the organism. I am also of opinion that a disturbance of the internal secretions of the structures which enter into the formation of the joints plays an equal, if not more important, *rôle* in these joint-diseases than that of more distant glands. What is the relation between these disturbances of internal secretions and those nervous influences which I have already pointed out exercise a primary causative effect in the production of rheumatoid arthritis, I cannot say with certainty. I look upon all these conditions of disturbed

internal secretion, however, as results of abnormal nervous influences upon the glands or tissues, the secretions of which become affected. My theory, therefore, of rheumatoid arthritis being a disease of disturbed internal secretions is not altogether inconsistent with the theory of the nervous origin of the malady. It has been seen that the nervous lesions associated with rheumatoid arthritis are essentially characterised by lowered nervous tone, and it is just such conditions of nervous depression which would be likely to favour those disturbed internal secretions which are associated with grave nutritional changes in the system.

Since writing the foregoing, I notice that Maggiori, Mosso, Wedensky and other observers have found that if the blood of a fatigued animal be injected into another animal that is fresh and unfatigued, all the phenomena of fatigue will be produced.

Wedensky is said to have found from chemical analysis that the fatigued blood contains a poison similar to the vegetable poison curara, being of the same chemical nature and of equally deadly character. Is it not presumable that this toxic result of fatigue is due to a disturbing nervous influence upon some internal secretion or other? And if so, is it not possible to outline with some hope of accuracy a picture of the pathological history of a typical case of rheumatoid arthritis? In such a picture we should have first nervous

depression more or less extreme, due to overwork, mental anxiety or worry, shock, general debility, or other similar cause. Then would ensue perverted internal secretion, and "autotoxication" of the blood, and circulating fluids of the body. After this would follow the accumulation of certain products of regressive metamorphosis in the tissues, with resulting morbid changes according to the particular locality and character of each individual tissue involved. Lastly, we should have all the complex changes, local and constitutional, which make up the pathological sum of this distressing malady.

I am aware that in advancing the foregoing theories and opinions upon the pathology of rheumatoid arthritis I have ventured upon much untrodden ground, and have incurred in consequence the risk of making deductions from insufficient evidence, and perhaps without sufficient justification. But whatever may be the weak points in my arguments for this new pathological explanation of this and similar joint-affections, I am very hopeful that the truth will be ultimately found, in the direction I have indicated, by some more experienced and competent observer.

Whilst these pages were in the press an article appeared in the *Lancet*, of April 25, 1896, by Drs. Bannatyne, Wohlmann, and Blaxall, which is of extreme interest to all who are engaged in the study and treatment of this

disease. It is claimed by these gentlemen that they have discovered a micro-organism in the synovial fluid and blood of patients suffering from rheumatoid arthritis. The bacillus was constant in its characteristics in eighteen cases examined, and has not been found in the synovial fluid from distended joints due to other causes.

Should further investigations support the results of these observers, the pathology of this disease will be greatly advanced by the discovery. My own clinical experience has long suggested to my mind such an organism in rheumatoid arthritis, and I shall not be surprised if the above results are confirmed by other observers.

Furthermore, if such a special micro-organism exists in this disease, we have here the probable explanation of the toxic influence upon the nervous system in these cases. The evidence seems to favour the conclusion that the various bacilli have the power of elaborating soluble poisons, and that these poisons act on either the peripheral or central nerve systems, "producing in one case an organic lesion, and in another only a functional depression."

CHAPTER VI.

Treatment.

The treatment of rheumatoid arthritis in the past, cannot be said to form a very brilliant chapter in therapeutics. Indeed, until quite recently, this disease was viewed by most physicians as practically incurable, when once the characteristic lesions had become developed. Latterly, however, as the causes and pathology of the disease have become better understood, and new principles of treatment have been patiently and perseveringly adopted, cases which at one time would have been relegated to the class of despair, are now not infrequently undertaken in a spirit of hopeful confidence, justified often by the happiest of results. Sir Alfred Garrod has expressed his views upon this subject thus: "Some time ago, I was inclined to take a very desponding view of the amenability of this disease to treatment, but year by year I have become more hopeful, and I have frequently seen patients who, I feel sure, if they had submitted themselves perseveringly to a rational course of

steady restorative treatment, instead of being led by the solicitations of injudicious friends and empiricising advisers to give themselves up to every form of quackery, would have been restored to health, instead of becoming, as many of them unfortunately do, miserable and incurable cripples."

An experience of over twenty years in a health resort where cases of this disease are frequent visitors for treatment, has afforded me exceptional opportunities of studying the results of its treatment, and I am able to bear out to the letter the opinion just quoted. In this connection I should like to observe, before entering upon the general subject of treatment, that this experience has taught me that there is no disease in which patience and perseverance in a given course of treatment are more necessary for success; many weeks and often several months must elapse before the disease shows decisive signs of yielding to the treatment adopted, and then it may be that for two or three, or more years, the general measures must be continued incessantly, and the special measures recurred to at periodical intervals, before the patient attains that degree of restored health which is rendered by such means more than possible. But herein is our difficulty, and here is often the cause of our patients' fall into the pit of empiricism and quackery so honestly deplored by the writer just quoted. How few possess the necessary

spirit of persistence and patience; how few have the means to meet the expense thus entailed, and how few can spare the leisure from business, or from domestic or other claims, which such treatment demands. No wonder that the miserable patient (often a woman who is both wife and mother with their attendant cares), wearies of the hope so long deferred, and seeking a shorter and quicker path to recovery casts aside the advice of the trained physician and yields herself to the "solicitations of injudicious friends," trying first this nostrum and then that, but all without avail, and eventually becomes only too often the crippled bedridden creature of this terrible malady upon whom the sun of hope in this life has finally and irrevocably set.

Nor is such an event uncommon—the writer has in his experience seen many such. Time after time patients of this class turn up, who spend a week or two at this Spa one season, a week or two at that another season, now at a home resort, then at a foreign Spa, but never staying long at any, and in the interval trying in turn all the nostrums that are suggested by ignorant friends or mendacious advertisements. Such cases are seen by the writer, it may be on the occasions of several visits during a period of several years, each time worse than at the visit of a year or two before, until at last they disappear altogether, and being unable to travel they visit the Spa no more,

and are often heard of as having joined the "submerged tenth" of this class of victims to which I have already referred.

In making the foregoing observations I do not wish to be misunderstood. When I urge the necessity of continued and persistent treatment for months, and it may be for several years, I do not mean that the patient must necessarily devote himself or herself exclusively to treatment, abandoning all business or domestic duties during the whole period. As I shall show later on, it is necessary when these cases are undergoing special treatment in the form of change of climate, massage, baths and so forth, that it should be continued say for three weeks to three months, as the case may be; that if the patient is benefited by such special treatment, it should be repeated for perhaps a shorter period in the future, at intervals of six or twelve months during several years, if any of the old symptoms persist. With regard to general treatment, such as diet, exercise and tonics, these will require following up in the intervals of such special treatment. Milner Fothergill's words are worth quoting at this point:—"Bear in mind always its pathology as a disease of depraved nutrition of the epiphyses, and not a hybrid betwixt gout and rheumatism, to be met by a shifting treatment—leaning now to gout and then to rheumatism—but a disease *per se* with its own requirements." There can be no

question that the too frequent confusion of this disease with gout or rheumatism is answerable not only for much failure in its treatment, but often also for producing positive increase in the original mischief. What has been said, therefore, upon the pathology of rheumatoid arthritis earlier in this work must be carefully borne in mind; treatment here, as in all cases, is more dependent upon a recognition of the true pathology of the disease than upon anything else. Rheumatoid arthritis being essentially a disease of mal-nutrition of the joint-structures and also of general debility, all treatment must be directed towards the improvement of the nutritive processes. Haller has said truly—"nothing in my experience so greatly tends to endanger recovery, nothing assists so much in perpetuating the rheumatic state, as over-active or depressing treatment."

As my principal object in the present work is to present a systematic and comprehensive review of our present knowledge of the treatment of rheumatoid arthritis, I now purpose devoting the remaining pages to this interesting subject.

CHAPTER VII.

Treatment (*Continued*).

Drugs, Diet and Clothing.

In discussing the question of treatment, it will be convenient to deal with the various classes of remedial measures which, from time to time, have been recommended in the treatment of rheumatoid arthritis in separate order, but not necessarily in the order of their importance. Whatever differences of opinion exist as to the pathological causes of this disease, there can be no question that it is essentially a disorder of impaired nutrition, associated with nervous depression of a more or less pronounced type.

Sir Dyce Duckworth, when speaking upon a paper dealing with the subject of rheumatoid arthritis some time ago, expressed a hope that the therapeutics of the author of that paper were not those of despair. Now, whilst I do not underrate the difficulties in treating this disease successfully, I wish at once to say that a growing experience of these cases has con-

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vinced me that very much may be done for them by suitable treatment. Again and again do I see the disease in its earlier stages practically cured, and even in some of the worst and apparently hopeless cases the degenerative processes are arrested, and more or less restoration of the joints takes place, so that those who have been helpless cripples often recover in large measure their powers of walking, and other useful movements. Therefore, the note I desire to strike at the very commencement of this section, which I purpose devoting to the treatment of rheumatoid arthritis, is one of hope. Granted that the treatment be based upon a sound and correct appreciation of the pathology of the disease, and that patience and perseverance attend upon an intelligent application of the remedial measures used, we might almost say that nothing is impossible in this direction. Indeed, I believe that the principal cause of so many failures in the treatment of rheumatoid arthritis is its frequent confusion with gout and rheumatism. This generally leads to treatment which is in the main unsuitable, and very often positively injurious. The notion of some special poison circulating in the blood, as in gout, which it is necessary should be got rid of at all costs, must be dismissed from the mind or it will prove a pitfall of disappointment and possible disaster. I do not mean that in some cases the disease is not associated with more or less gout or

rheumatism. This, as we have already seen, may occur. What I wish to lay stress upon is this, that in the majority of cases of rheumatoid arthritis no such concurrent disease exists, and that even when it does the idea of an eliminatory process of treatment is rarely admissible. Why? Because these processes of treatment, which are often so useful, particularly in gout, are too depressing in rheumatoid arthritis. Always keep in view the fact that in this disease we have degenerative changes in the joints and neighbouring structures, associated with depraved nutrition and a tendency to general weakness and waste. Hence, whatever factors enter into the course of treatment adopted, whether related to diet, drugs, baths, massage, exercise, or what else, anything that tends to lower the system must be avoided, and things that are likely to improve the processes of general and local nutrition, and to build up a good state of health, must be encouraged.

Drugs.

Although there are some drugs which are often found useful as adjuncts to the treatment of rheumatoid arthritis, we do not at present possess any drug which exercises a special influence in this disease such as that exercised by the salicylates in rheumatism, or by colchicum in gout. Whether therapeutical science will ever produce such a specific it is impos-

sible to say. If it does, I am inclined to think it will come from that newer department of therapeutics which deals with the use of animal extracts or preparations as remedial agents in the treatment of disease. But this subject will be discussed in a special chapter later on. The drugs which are most used are arsenic, iron, bi-carbonate of potash, iodide of potassium, guaiacum, sulphur, actea racemosa, quinine, syrup of the iodide of iron, and cod-liver oil.

What is generally understood as the alkaline treatment is practically useless and often does harm in this disease. Nor can I say much in favour of iodide of potassium, like some writers. Indeed, I have often seen chronic cases which appeared to me to have suffered positive injury from the use of that drug. When administered for a lengthened period, and in the large doses so commonly given, it seems to dry up the joint-structures and produce digestive disturbances prejudicial to the general health of the patient. If an alterative be indicated, arsenic is perhaps the best in these cases, and I find the following a good combination :—

℞ Liq. arsenicalis	.. ..	♏ xxiv.
Pot. bicarb.	.. ..	ʒij.
Sp. ammon. arom.	..	ʒij.
Inf. gentianæ ad	..	℥vi.

Fiat mistura. Capiat ℥ss ter in die, ex aquæ post cibos.

Iron is very useful, especially in anæmic

patients, and it may be given in most cases with advantage. Cod-liver oil is invaluable in improving nutrition, and actea racemosa, as also guaiacum, sometimes afford relief.

Of drugs used as external applications a long list might be given. They include almost all the usual counter-irritants, stimulating liniments, and anodynes. These external applications can, however, at the best be only viewed as palliative measures for affording temporary relief from local distress. It is therefore well, when they are used, to caution patients not to expect too much from them, for fear that, their attention being too much directed to such remedies, other means of greater importance be neglected.

Diet.

We now come to the question of diet, the importance of which it would be difficult to over-estimate in the treatment of this disease. A full, generous diet, not too stimulating, and arranged with due regard to the digestive conditions of each particular case, is the golden rule to observe in these cases. There is no need for that extreme discrimination and caution necessary in the dieting of gouty patients. As a matter of fact many articles of diet which would be excessively baneful in gout are of real benefit in rheumatoid arthritis. Animal foods, including a large proportion of fats, are useful. A plentiful supply of fresh

vegetables may be allowed, and celery and Spanish onions seem to be specially suited to these cases. Tripe with boiled onions and milk makes a very nutritious dish, and one that I frequently order with great advantage. A purely vegetarian diet has been recommended by some, but I have not met with any good results amongst those patients who have told me they had tried such a dietary.

The question, however, is not so much one of what shall be taken and what shall not be taken; it matters little what the exact constitution of the dietary may be, so long as it is assimilated and nutrition is improved. A good rule, and one which I always impress upon patients, is to weigh weekly or fortnightly, and to carefully observe the changes. It may be taken as a safe conclusion if there is a gradual increase in weight, no matter how slight the weekly increase be, that things are going well. On the other hand, if there is a gradual decrease, it is equally certain that matters are going ill. I cannot impress too strongly upon the reader the importance of this test in the treatment of these cases. In my practice I find it an almost infallible index of the progress or otherwise of the patient. It is all the more important when we remember that such cases often show signs of apparent improvement, when in reality the general condition is worse, and the tendency is backward instead of forward.

Now, as to alcoholic drinks. Here, again, this disease differs from gout, alcohol being not only admissible, but often a desirable factor of diet. Care should, however, be exercised in administering spirits. A little brandy or whisky may be useful occasionally, but I strongly disapprove of the common custom of ordering spirits daily in more or less large and repeated quantities. Patients often come to me who are taking stimulants in this way with the mistaken notion that they are necessary to their support, and at the same time they are taking scarcely any food. The great objection to this practice is that no improvement in the nutrition is obtained, but often the general waste is accelerated by the irritative influence of the alcohol upon the nervous system and digestive organs. Good claret or burgundy, stout or bitter beer, are the best forms in which to administer alcohol in rheumatoid arthritis. My favourite rule is to give bitter beer in small doses—five ounces twice a day with food. It assists the appetite and digestion, promotes assimilation and improved nutrition. The effects upon the general process of nutrition are sometimes very remarkable, and, in my opinion, often greatly conduce to the restoration of the crippled joints. A striking illustration of this came under my notice some time ago. The patient, a young lady, came to Buxton in a most lamentable condition. All the joints of the upper and lower extremities,

except the hips, were affected, also the temporo-maxillary and cervical articulations. She was completely helpless, and had not been able to be moved from her couch for about a year. Some of the joints were very painful, preventing sleep, and necessitating frequent anodyne applications. The appetite and digestion were greatly impaired, and a process of rapid waste had been going on until, at the time I saw her, she scarcely weighed five stones. It was impossible to get her to the baths, and the treatment was necessarily confined to diet, tonics and dry massage. Half a glass of bitter beer was given twice a day with the food. The nutrition improved, the weight increased rapidly, pain disappeared, and she could soon bear gentle efforts to move the joints. In a few weeks she was able to walk out on crutches, and can now move about with the aid of only a stick, and can also play the piano. In three months her weight increased about two stones. In this case the beer was of great value as part of the dietary, and to it, as in many similar instances, I ascribe much of the success which followed the treatment.

Clothing.

The clothing of the patient is a matter of no little importance in this disease. The patient should wear light woollen undergarments *next to the skin*. These should not fit too loosely, but should cling to the skin with a sort of

gentle elastic pressure. I am in the habit of making a strong point of this with my patients, and therefore, recommend by preference woven ribbed vests, drawers and stockings. The "ribbing" should be parallel with the axis of the body and the limbs, as this causes the garments to cling closely to the limbs and trunk without uncomfortable pressure. This I consider an advantage because, in addition to being a means of protection from cold, the skin is thus exposed to frequent frictions during the movements of the body, and this excitation of the peripheral nerves and bloodvessels determines blood to the surface of the body, keeps the skin warm, helps to prevent surface-chill, and otherwise promotes a healthy action of the cutaneous structures. The vests should always have long sleeves, and it is often wise to afford additional protection to such joints as the knees, by wearing knitted woollen knee-caps. Wash-leather underclothing has been highly recommended by some writers, but I think that knitted woollen garments of suitable thicknesses are infinitely preferable. The feet should be carefully protected by wearing porous cork or straw soles in the boots. I also recommend stockings to be worn with double knitted soles. All excessive clothing should be avoided as it often does much harm by keeping the body in perpetual heat and perspiration, and by subjecting the patient to unnecessary fatigue from the weight of the superfluous clothing.

CHAPTER VIII.

Treatment (*Continued*).

Massage, and Active and Passive Movements.

It is surprising that so little attention has been paid to the use of massage and exercises in the treatment of rheumatoid arthritis whilst so much has been written upon the curative effects of baths and mineral waters. Spa-practitioners are naturally exposed to the temptation to exaggerate the advantages of baths and waters in this, as in many other diseases, but truth compels me to say that whilst certain balneological methods possess an undoubted value in rheumatoid arthritis, it is not improbable that massage and suitable movements are even more valuable. I will even go so far as to say, speaking from my own personal experience, that given the other advantages, dietetic and climatic, were I compelled to make choice between the two methods, I should elect to use massage and manipulations of the joints in preference to the use of baths in this disease.

Massage.

In his valuable work upon the practice of massage, Dr. A. Symons Eccles makes the following observations which are worth quoting in this connection.

"It is not unreasonable to believe that the inaction of muscles associated with a rheumatic joint induces the accumulation of waste-products in the articulation itself, and in its surroundings. The lymph-pumping function of the muscles normally acting on the joint is thrown into abeyance, and the influence of muscular contractions in aiding the outflow of the venous current is lost. The intra-muscular arterioles, as also those of the skin, are contracted; and thus the blood-supply to these structures is seriously interfered with, so that the washing out from the joint and other structures of the morbid products accumulated therein is retarded, thus further increasing stasis in the inflamed foci. Inasmuch as most cases of chronic arthritis afford evidence of inflammatory deposits in the fibrous and muscular tissues connected with the joint, the lymph spaces of the connective tissue being clogged and matted together so that the movements of tendons and muscles are mechanically impeded; it is not surprising that after an attack of rheumatism the fibro-serous tissues are peculiarly liable to a recurrence of inflammation, especially if they are exposed to a

repetition of the predisposing and exciting causes."

In estimating the value of massage in rheumatoid arthritis, we must take into consideration its influence upon the general nutrition of the body and its local influence upon the affected joints and their proximate muscles. It is here that my practice probably differs from that of most who use massage in the treatment of this disease, and it is this difference which so often enables me to obtain excellent results in cases where massage has been previously used with no advantage.

I am strongly of opinion that in no other form of treatment is it more important to bear in mind the distinctive character of this disease as one of mal-nutrition and impaired general health, than in the use of massage. Hence, he who only uses massage to the local joint-affections only obtains, at most, part of the benefit available, and possibly may lose it altogether. I therefore in almost all cases recommend general massage of the whole trunk and the upper and lower extremities, to be applied gently for a few minutes daily, or, on alternate days, with little or no attention to the joints at first. This general massage should consist of quick, gentle effleurage of the skin, followed by light petrissage of the muscles and deeper structures. From ten to twenty minutes at a time is long enough, and great care should be taken that the attendant uses

very little force. Much injury is often done by giving massage too strong and too long, fatigue and exhaustion being produced, resulting in more harm than good in these cases. I feel that I cannot urge this point too strongly upon the attention of the practitioner who is wishful to obtain the best results from this treatment. The majority of attendants have this failing of administering massage with excessive force and for too long at one time. It is therefore desirable to prescribe the exact time and the particular form of massage, and to see that it is not given too strongly.

When administered scientifically and with due consideration as to the constitutional condition, it is seldom that an improvement in the general condition of the patient is not very speedily evident. The skin becomes softer and more pliant, there is marked decrease in the hyperæsthesia so often present in these cases, the muscles become firmer, the appetite is improved, and the patient confesses to feeling better generally. It is then that more particular attention should be paid to the joints. *Massage à friction* should now be applied to the joint-surface as well as kneading and squeezing of the tendons and fibrous surroundings. The force, at first very light, may be gradually increased to strong and firm pressure according to the sensitiveness of the parts. There is no doubt as to the value of massage when thus applied, in promoting

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absorption of exudative products in and about the joints. Only those who have personally seen this treatment applied in such cases can fully realise the remarkable and speedy effects which so often follow.

Perhaps I ought to say a word here upon the use of "wet massage," or the massage bath in rheumatoid arthritis. I am sorry that I cannot say much in favour of that form of massage in this disease. Personally, I am strongly opposed to the use of the massage bath in the majority of these cases, particularly when the system is much debilitated. The combined effects of the manipulations of massage and the highly stimulating influence of the warm douches are, as a rule, followed by too much fatigue and depression, which cannot but be injurious to the general condition of the patient. Hence I prefer to administer massage and the warm douches on alternate days rather than in one combination on one day. This is more easily borne, the treatment being dosed out, as it were, according to the capabilities of the system to bear it. It is altogether a mistaken idea that massage with water is better than with the dry hands. There are, of course, many conditions in which the massage bath is a most useful remedy, and as such I have nothing to say against it; but to obtain the true and best effects of real massage many years' practical experience confirms me in the opinion that nothing can equal its

application by the simple dry hands of a trained and skilled operator.

Active and Passive Movements.

Besides the ordinary manipulations of massage, active and passive movements of the affected joints are extremely useful in rheumatoid arthritis when carried out with proper judgment and care. In the case of joints that have already become stiffened and fixed, gentle but frequent attempts at passive movement should be made. The force may be gradually increased as the joint begins to yield and the patient becomes more able to bear it. Anything like sudden or violent movement is to be avoided. Firm but gentle and persuasive force is the best, and it is really astonishing what can be thus accomplished with patience and perseverance on the part of the attendant on the one hand, and the patient on the other. Large numbers of joints which appear to have become irremediably locked may thus be restored to fair working mobility and usefulness.

When the joints have become loosened a little, or in the case of joints that have not yet become fixed, active movements in addition to the passive exercises may be practised. Hence the patient should be encouraged to frequently move the joints at short intervals. In addition to this, resisted movements may be practised in moderation, the patient endea-

vouring to perform flexions and extensions of various parts, whilst the attendant at the same time with his hand applies gentle resisting pressure in the opposite direction. These movements are very useful in exercising the muscles of the patient, promoting their growth and strengthening those which have become atrophied and weak. In all these movements and exercises the same word of caution is needed that I gave in speaking of massage. All excess should be studiously avoided. Anything that causes fatigue, exhaustion, or excessive pain is generally very mischievous, and often does harm instead of good.

CHAPTER IX.

Treatment (*Continued*).

Baths and Mineral Waters.

The treatment of rheumatoid arthritis by baths and mineral waters has long held a position of favour in the profession, nor is this without some justification. Baths, when judiciously and properly applied, are of undoubted value in this disease, and many cases are greatly benefited by their use. It cannot, however, be emphasised too strongly that baths are no exception, but follow the law as to the action of all remedies for the treatment of disease, and must be prescribed and dispensed with the same care and attention that are exercised in the use of the most powerful drugs. It is only too often forgotten that special physiological and therapeutical knowledge are quite as useful, and probably as necessary, in the balneological treatment of disease as in any other branch of medical practice, and in no case is this more true than in the treatment of rheumatoid arthritis by baths.

There are many spas both at home and abroad, the waters of which are recommended

in this disease. Homburg, Wildbad, Carlsbad, Marienbad, Aix-la-Chapelle, Schwalbach, Spa, Mont Dore and Aix-les-Bains are amongst those on the Continent which are resorted to with more or less success. Aix-les-Bains particularly has earned a wide reputation in these cases. Amongst the many patients, however, whom I have seen subsequently to having undergone a course of treatment at that spa, I have never yet observed any improvement or benefit which I believe could not have been obtained equally well, and perhaps better, at one of our home spas. This leads me to remark that the benefit from spa treatment in this disease probably does not depend so much upon the particular character of the mineral water as upon the special methods of application of the water, the climatic influences, the dietetic *régime* and other factors which enter into the course of treatment at the spa. Whether it be the thermal sulphur water of Aix-les-Bains, or the indifferent thermal water of Wildbad, or the mineral water of some other spa, the conditions of application, such as temperature, douches, immersion and duration will very likely exercise more influence than any particular mineralisation of the water in benefiting cases of rheumatoid arthritis. I, of course, only refer here to the external application of mineral waters. Any benefit that may arise from the internal use of mineral

waters will, of course, depend upon their mineralisation. Thus cases associated with anæmia will benefit by drinking chalybeate waters, and those complicated with portal congestion and hepatic troubles are assisted by the internal use of saline waters. As to what is the influence of indifferent thermal waters taken internally in this disease, we are still in doubt and uncertainty.

Amongst spas in this country, Bath, Buxton, Harrogate, Strathpeffer, Droitwich, Woodhall and Leamington are largely resorted to for the treatment of this disease. At each and all of these resorts great improvements have been effected in recent years by the introduction of improved methods and appliances, particularly in the matter of douches and massage. In these respects they are probably as well equipped now as the most famous continental spas, and it cannot but be viewed as a grave error of judgment now-a-days when a patient suffering from rheumatoid arthritis is sent to a foreign spa, and subjected to the fatigue and exhaustion of a long and trying journey, before trial has been made of the resources of one or other of our home spas.

It is not my present intention to expatiate upon the particular merits of any one spa, but rather to point out some of the principles upon which the success or non-success of bath-treatment in this disease depend. There can be no doubt that warm baths are more useful here

than the colder forms of baths, but they must be used with careful discrimination and proper judgment. I have on various other occasions drawn special attention to the subject of excessive thermal treatment in this disease. An experience of over twenty years of bath-treatment has afforded to me accumulating and conclusive evidence of the serious injury which is only too often done in these cases by the pernicious practice of using baths too hot and too long. Hot immersion baths, vapour baths, and Turkish baths are alike constant causes of irreparable injury by reason of their improper use in this disease. The principal cause of their abuse is not far to seek, and consists in the fact that these hotter forms of baths do, generally speaking, especially at first, afford considerable relief to the joints, which for a short time are rendered less painful and more easily moved. This temporary relief is, however, very delusive, and is obtained at the expense of the general health, which is further debilitated and reduced by such measures, and this only favours a more rapid development of the disease in an aggravated form. The matter is so important that I venture to relate the following case, which illustrates forcibly the foregoing remarks.

The case which came under notice in the early years of my practice presented several features of peculiar interest, and made a profound impression upon my mind at the time.

The patient, a young married lady, arrived in Buxton presenting the most pitiable spectacle of helpless suffering from this disease that it has ever been my lot to witness. She had lain upon her back on an invalid's couch, unable to move or be moved, for about nine months. Three facts were impressed forcibly on my mind by this case: (1) the strong predisposing influence of mental and physical depression in the production of rheumatoid arthritis; (2) the injurious and aggravating influences in this disease of excessive thermal treatment, *e.g.*, the too frequent and protracted use of Turkish or vapour baths; (3) the paramount importance of improving the general health in the treatment of this disease.

Case. Mrs. J——, first seen July 5, 1884, aged 35. Married, four children. Two miscarriages. Previous health fairly good, but never robust. Both parents dead. Father suffered from gout. Has had sixteen brothers and sisters, only eight surviving, and all delicate except one, a half-brother. A half-sister who died was very gouty. Present condition began with pain in lower part of back about three and a-half years before. Six months later (June) left knee suddenly became swelled and painful. Then the other knee, ankles, and finger joints followed same course, the pain in back continuing. Patient did not feel very ill at the time, but lost flesh rapidly, and was unable to walk for about six months. She

then visited a Hydro. in West of England, and was soon able to walk, first with crutches, then without aid. Returning home she resorted to use of warm wet sheet packs every other day for three months, when left eye became "blood-red" and sight very dim. She then went to Bristol, took two Turkish baths daily for a month, returning home much better. On second day after return caught cold and remained in bed with slight bronchitis. After this she was able to walk about for nearly two months, when, the joints again becoming stiff, she re-visited Bristol for Turkish baths. Remained a month, lost five pounds in weight, was very weak, and unable to take baths regularly. Though able to get about at home for a short time, she became rapidly weaker and the joints worse.

In May, 1883, visited Clifton and resumed daily Turkish baths at Bristol *under the advice of the bath attendants.* After a fortnight she became so weak as to be unable to walk, and a medical man was called in. Now commenced rapid loss of flesh and strength. Joints became worse, and in a few weeks she was confined to bed. For past nine months before I saw her had lain upon her couch totally helpless. Could only move right arm a little. Body emaciated, skin hanging loosely on the bones. Almost every joint in body affected—enlarged, stiff, and painful. Knees contracted and fixed. Ankles, hips, shoulders, elbows, and

wrists immovable. Unable to raise hands to face. Lower jaw and neck so stiff and painful that she could only move jaw with pain and difficulty, and was unable to turn her head. Left iris adherent, sight dim, with intolerance of light. Mastication, deglutition, and articulation alike difficult and painful. Any active treatment was obviously out of the question. I prescribed frequent liquid nourishment, tonics, and gentle friction of limbs, at same time making persistent mild attempts at passive movements of joints, and placing her out in the open air as often as possible. Although the case was evidently hopeless, there was a slight improvement in general health, and considerable loosening of elbow and shoulder joints. After some weeks she suddenly collapsed and died, her death being accelerated by shock due to one of her nurses being seized with a fit of epilepsy in her room.

I should add that the patient attributed the commencement of her trouble to nursing and watching her sick child for six weeks ceaselessly, when she became worn out with exhaustion.

This case presented in a very marked degree all the characteristics of rheumatoid arthritis dependent upon a myelopathic origin, as evidenced by the profound atrophic paralysis and arthritic disorganisation. Now it is in such cases, where the neural element plays an important part in the causation of the disease,

that the higher thermal treatment is contra-indicated and baths of high temperature very frequently do irreparable mischief. From observations I have made of numerous similar cases which have come under my care since the above, and which have suffered from a like abuse of Turkish and other hot baths, I am of opinion that the awful condition of the case just narrated was brought about in great measure by this treatment. Much benefit might have resulted, had the case been taken in hand earlier, from the combined use of change of air, tonics, diet, and scientific massage.

Nor is such mischief confined to the abuse of Turkish and vapour baths. I have often seen much damage which has resulted from the excessive use of hot immersion baths at Bath, Buxton, Droitwich, Aix-les-Bains and other spas. It used to be a common practice at these spas to give the baths too hot and to keep patients in them too long at a time, but I am glad to know that this is now rapidly giving place to more rational treatment. Speaking generally the temperature of the immersion bath should not exceed 98° F., nor be given below 86° F. The time of immersion should vary from 5 to 10 minutes. Sometimes the body should only be immersed up to half or three-quarters depth, the water being laved over the immersed parts of the body. The application of warm douches to the spine and the affected joints is extremely useful in this

disease, and may often be used with benefit where immersion baths are contra-indicated.

I have already referred to the massage bath, the use of which, in the form of the Aix-les-Bains massage douche bath, has become very popular in this country, and I have expressed the opinion that it often does harm in these cases by producing too much fatigue and exhaustion, that is if the patient shows the common condition of concurrent debility and general weakness. In such cases this bath may be divided, as it were, by giving the massage dry on one day and the hot douching on the next day.

General Turkish or vapour baths must be considered inadmissible, but local applications of vapour or hot air to affected joints by means of special appliances are sometimes very beneficial.

Before closing this chapter on bath treatment, perhaps I ought to say a word on the use of the so-called electric bath in rheumatoid arthritis. Remak was the first, I believe, who advocated this practice, and he was followed by others who thought that by its use good could be effected in this distressing disease. I think, however, I shall not be far from the mark when I say that the experience of most of these early observers was similar to my own, viz., very disappointing. I well remember in the earliest years of my practice at Buxton, being somewhat fascinated by this method,

upon which lack of experience led me to build high hopes of really valuable results, but these were doomed to disappointment. I never saw any benefit which could not be obtained as well from an ordinary bath at a similar temperature, and I have long since abandoned the use of the electric bath altogether. I do not deny that much good may sometimes be done by the local application of electricity to the atrophied muscles. This, however, is altogether different from the use of electricity in the form of a bath, which seems to me to have little more to recommend it than the profound measure of faith which it so frequently excites in the breast of the patient.

Speaking of the Electric Bath, Dr. A. de Watteville says: "Much has yet to be done before its efficacy can be satisfactorily established; one point is certain, however, and that is the uselessness of the bath for local diseases." The eminent American physician and therapeutist, Roberts Bartholow, who is no mean authority on the medical uses of electricity, is more emphatic still, and his opinion is worth quoting. He says, "So great is the resistance offered by the water to the passage of electricity, that but little if any effect is produced by even powerful currents. Charlatans who apply this method impose on their ignorant clients by connecting the electrodes with some part of the patient's person, but when this is done it is no longer an electric bath. Under

any circumstances, applied as completely as can be, the electric bath is a very inferior application, and violates the canon which requires applications to be made to the affected part."

In estimating the value of spa treatment in rheumatoid arthritis, it is always necessary to bear in mind the important matter of climatic influence which is always in operation, either for good or for ill, during any given course of bath treatment. I set so much importance upon this that I propose in the next place to devote a short chapter expressly to the subject.

CHAPTER X.

Treatment (*Continued*).

Climate in Rheumatoid Arthritis.

Climatic influences have in late years come to be recognised as highly important factors in the treatment of a large variety of chronic diseases. There are many conditions which respond never so readily nor so favourably as when the patient is exposed to the influence of climatic change of a benign character. Hence the treatment of disease by climate occupies a position probably equal to that of treatment by baths and mineral waters. This is certainly true of the treatment of rheumatoid arthritis, for whatever question there be as to the value of baths and waters in this disease, there cannot be any doubt as to the importance of favourable climatic conditions. The truth and force of this will be self-evident when it is remembered that the disease is essentially one of impaired nutrition and debility, with consequent degenerative processes of a low and retrogressive character.

In selecting, therefore, a suitable resort to which to send such patients, with the hope of obtaining real and permanent benefit, special regard should be paid to the subject of climate. The points which call for particular attention are geological formation and subsoil, altitude above sea-level, conditions of vegetation, winds, temperature, rainfall and snowfall, sunshine and light, dryness and purity of air, and sparseness of population—factors which are important in their relation to the treatment of all forms of disease, but especially in connection with rheumatoid arthritis. The geological situation is very important. Clayey and damp soils are to be shunned, whilst mountain limestone, millstone-grit, gravelly and sandy sub-soils are to be preferred. Elevated positions are, I think, much better for this disease than places at the sea-level. Localities where north, east, and north-easterly winds prevail should be avoided, hence elevated resorts protected from such winds are to be recommended. Lowness of temperature, if the air be pure and dry, is often advantageous in improving the appetite and general health. Crowded and populous towns are as undesirable as are overcrowded tenements for the residence of such patients. Sunshine and light without excess of vegetation are of great value in this disease. Thus all conditions of climate which conduce to an improvement of the general health by increasing the appetite, im-

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proving digestion, stimulating the functions of the skin and lungs, adding tone to the nervous and muscular systems, and otherwise bringing about a better state of the health generally, are to be preferred before everything else. On the other hand, those conditions of climate which debilitate the system and depress the nerve centres are to be avoided. Hence climates with too much hot sunshine, high mean temperatures, and stagnant atmospheres are in the highest degree detrimental in this disease.

The following case will illustrate the very great value of the climatic factor in the treatment of rheumatoid arthritis.

E. V., aged 40, daughter of a deceased medical man, came under my care with all the joints of the upper and lower extremities affected. There were pain, swelling and stiffness of ankles and feet, knees, hips, hands, wrists, elbows, shoulders, clavicles and neck. She had lain helpless on her back for about a year, unable to be moved. She was dreadfully emaciated, and reduced to less than six stones in weight. Her sufferings were extreme, and necessitated the constant attentions of two attendants to afford measures of temporary relief. It is unnecessary to relate the previous history of this case, and I need only state that there had been a continuous and rapid increase in the disease, and the patient had been pronounced by several medical men as hopeless.

As it was impossible to convey the patient

to the baths, balneological treatment was out of the question. The course I adopted was to prescribe an iron tonic with a liberal nourishing diet, including a large quantity of milk and half a tumblerful of bitter beer twice daily. At the same time I had her placed out in the open air, suitably covered with warm wraps, whenever the weather was favourable, and massage of the whole body administered daily with gentle friction and passive movements of the joints. A half-pint of the Buxton mineral water was also given twice a day. From the commencement of the treatment a marked and continuous improvement was observed. The patient gained flesh rapidly. She lost all pain, and was soon able to rest the whole night through. The joints gradually improved, so that she was able at first to sit in a chair and then to walk with crutches. Her weight increased from a little above five stones to over eight, and she left Buxton after about four months, able to write letters and do knitting. She returned in June the following year, when I found the improvement had been fully maintained, and during a second sojourn at Buxton of four months, when the same treatment was resumed, she further improved so rapidly as to become able to get up and down stairs without assistance, and to walk long distances with the aid of a single stick. When she left the joint deformity had almost disappeared, and the general improvement has continued since she returned home.

In the above case I am inclined to accord the principal influence in the restorative process to the climatic factor in the treatment which increased the appetite, improved the digestion, and raised the general tone of the system. I cannot, therefore, lay too much stress upon the importance of choosing resorts for the treatment of this disease where the climatic conditions are calulated to exert the most powerful influence upon the process of nutrition. All forms of disease are forms of disturbed nutrition, and all successful treatment must be directed towards restoring the impaired nutrition. If this be true of diseases generally it is pre-eminently true of that particular disease which is now under discussion.

CHAPTER XI.

Treatment (*Continued*).

On the Use of Animal Extracts in Rheumatoid Arthritis.

The extraordinary results of the thyroid treatment of myxœdema have formed a prelude to extensive inquiries and investigations into the possible effects which the administration of extracts of various animal tissues, or the animal substances themselves, might have upon diseased conditions of different kinds.

I have elsewhere in the chapter on pathology discussed the possible relations of the internal secretions of certain glands, such as the thyroid and the pituitary body, to the causation of chronic joint affections, and also to a disturbance of the internal secretions of the joint structures themselves being a probable common cause of such affections, and must refer the reader to what I have there said for a fuller explanation of the reasons which have led me to advocate the use of animal extracts in the treatment of rheumatoid arthritis. The sub-

ject had long occupied my attention, and I was induced to lay my views before the profession in an article which was recently published in the *Medical Magazine*.* In that article I ventured to submit the following proposition :—

Having regard to certain recently ascertained physiological facts, particularly that every tissue and every organ of the body furnishes an internal secretion which exercises an important influence upon the process of metabolism, I consider it highly probable that the synovial fluid of joints and bursæ is not the only secretion with which we should be concerned in studying the functions and diseases pertaining to joints. Indeed, I would go further and say, in regard to those profound arthritic changes associated with rheumatoid arthritis and similar joint troubles, that a disturbance of the internal secretions of some of the tissues which make up the structure of the joints plays the most important part in producing the morbid changes.

I am prepared, of course, to admit the influence of internal secretions from other glands and tissues not connected with the joints, which it has been shown circulate in a certain equilibrium of combination in the blood, but I am inclined to view such an influence, when it exists, as occupying a subordinate or minor place in the diseased process. I am even ready

* *Medical Magazine*, April, 1896, p. 377.

to admit that this influence may be in many cases the primary exciting cause of the local joint-mischief.

Whether, however, it arises primarily from the influence of a disturbed secretion from a distant part, or from disturbance of one of its own internal secretions, I contend that the morbid processes in and about the joint, when once established, are probably in the main influenced by abnormal conditions of local internal secretions.

Now if these internal secretions of glands and tissues play such an important part in the process of metabolism, it is a most interesting inquiry how far the artificial introduction into the system of such secretions, by means of extracts and other preparations of fresh glands or tissues of healthy animals, may be useful in the treatment of disease. The well-known success of thyroid treatment of myxœdema and other diseases has led to the trial of various animal extracts in numerous morbid conditions with more or less satisfactory results. I was, I believe, the first in this country to apply animal extracts in the treatment of chronic articular diseases, the only near approach to my recommendation having been made by Professor Poehl of St. Petersburg, who has recommended a specially prepared essence of spermin in the uric acid diathesis, and this has been used in certain chronic joint-affections, particularly in Italy and Switzerland.

Ever since thyroid treatment first established a position in therapeutics, I have been impressed with the question of extending the principle to the treatment of chronic joint-diseases, especially of a degenerative character, and the more I have considered the subject the conviction has become stronger that we have here a promising opening in the field of therapeutics.

The extracts which appear to me to offer the best possibilities of success in the treatment of articular affections are bone marrow, orchitic, ovarian, brain and spinal cord, pituitary body, and articular or synovial extracts. Some of these extracts I have found to be very useful adjuncts to the treatment of rheumatoid affections.

One of these which has been made at my suggestion from the fresh synovial membranes and articular cartilages of healthy animals seems to give promise of good results. The preparation is a glycerine extract, one minim being equal to one grain of the fresh substance. It is palatable and easily retained by the patient. I administer it in doses of fifteen to thirty minims two or three times a day. It was in considering the theory which I have advanced as to a disturbance of the internal secretions of the various tissues which enter into the structure of joints probably being the most important cause of the degenerative changes in chronic joint-affections, that I was led to use such an

extract. It occurred to me that the administration of a suitable extract prepared from the articular cartilages and synovial membranes of healthy animals, might be useful in restoring the physiological equilibrium and promoting the restoration of the diseased joint-structures.

At the time of writing I have been using this extract for some months past, and in many cases there has been a distinct improvement in the joint-affections. It is, however, too early to speak with certainty as to results. The cause of experimental therapeutics and practical medicine is often damaged by the undue and unnecessary haste which some writers display in publishing results and conclusions based upon observations which lack the quality of patience on the one hand, and scientific and unprejudiced discrimination on the other. Speaking for myself, I have had a sufficiently long experience in practical therapeutics to learn that methods which would seem to hold out hopeful prospects of success only too often, after mature and extended trial, yield the bitter fruit of disappointment.

I have elsewhere pointed out that, with regard to the remedy above suggested, we must not expect it to be of real or permanent benefit in this disease unless regard be also paid to those principles of general treatment, which are doubtless essential adjuncts to the successful treatment of these chronic affections. Diet, change of air, exercise, baths

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and douches, massage and manipulations, as described in previous parts of this work, will probably continue valuable and necessary aids to treatment. If, however, by the use of this articular, or some other animal extract, we can promote more rapid regeneration of morbid structures and more thorough restoration of the diseased joints, then we shall welcome it as a hopeful feature in the treatment of a difficult class of diseases.

I now come to the conclusion of what has been to me not an uncongenial task, in trying to take a small share in the work of elucidating some additional truth as to the causes of rheumatoid arthritis, and the most successful methods of treatment. The really distressing character of the malady, and the hitherto only too frequent hopeless nature of its treatment should form strong incentives to further and fuller investigations, with a view to more successfully combating the disease. That this is by no means a vain hope is confirmed by the experience of all who have given earnest and patient attention to the subject, aided by the light which modern pathology and clinical experience have thrown upon the disease.

In conclusion, let me reiterate the importance above all things of patience and persistence in the use of whatever treatment holds out a prospect of benefit. Scores of sufferers from this malady become hopeless cripples who might, I am persuaded, be saved, at least,

from the extreme measure of disablement which becomes their lot, if only they could be held fast to a suitable course of treatment. To apply the words of the late Milner Fothergill: "This way may be long hidden from sight, hard to find, thorny to travel, beset with quagmires or boulders, long and wearisome, seemingly endless; but on it the traveller goes with unshaken resolution to success at last."

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